

In the Claims

The following Listing of Claims, in which deleted text appears ~~struck through~~ and inserted text appears underlined, will replace all prior versions, and listing, of claims in the application.

LISTING of CLAIMS

Claims 1-27 (Canceled)

28. (Currently Amended) A method comprising:

- a) coupling a first PNA monomer to a sterically-hindered solid support comprising a sterically-hindered acid-forming cleavable linker wherein the PNA monomer comprises a base-labile N-terminal amine protecting group;
- b) optionally washing the solid support to remove excess first PNA monomer;
- c) treating the solid support for a period of no more than about 1 to about 2 minutes with a deprotection reagent, under basic conditions, that deprotects the base-labile N-terminal amine protecting group ~~that removes the base-labile N-terminal-amine protecting group from substantially all of the support bound first PNA monomer;~~
- d) washing the solid support to remove the deprotection reagent; and
- e) coupling a second PNA monomer to the N-terminal amine of the first PNA monomer after performing steps (c) and (d) to thereby form a support bound PNA dimer.

Claims 29-40 (Canceled)

41. (Currently Amended) A method comprising:

- a) coupling a first PNA monomer to a solid support comprising ~~an a~~ a sterically-hindered acid-forming cleavable linker wherein the PNA monomer comprises an acid-labile N-terminal amine protecting group;
- b) optionally washing the solid support to remove excess first PNA monomer;
- c) treating the solid support with a deprotection reagent, under acidic conditions, that deprotects the acid-labile N-terminal amine protecting group;

- d) washing the solid support to remove the deprotection reagent; and
- e) coupling a second PNA monomer to the N-terminal amine of the first PNA monomer to thereby form a support bound PNA dimer,

wherein the final loading of the PNA dimer on the solid support is greater than or equal to 0.08 mmol per gram.

Claims 42-74 (Canceled)

- 75. (Previously Presented) The method of claim 28, wherein the first and second PNA monomers are Fmoc(Bhoc) PNA monomers comprising the same or a different nucleobase.
- 76. (Previously Presented) The method of claim 75, wherein the nucleobase of the first and second PNA monomer is independently selected from the group consisting of: adenine, cytosine, guanine, thymine, uracil, 5-propynyl-uracil, 2-thio-5-propynyl-uracil, 5-methylcytosine, pseudoisocytosine, 2-thiouracil and 2-thiothymine, 2-aminopurine, N9-(2-amino-6-chloropurine), N9-(2,6-diaminopurine), hypoxanthine, N9-(7-deaza-guanine), N9-(7-deaza-8-aza-guanine) and N8-(7-deaza-8-aza-adenine).
- 77. (Previously Amended) The method of claim 28, wherein the base-labile N-terminal protecting group is Fmoc.
- 78. (Withdrawn – Currently Amended) The method of claim 28, wherein the deprotection reagent is a solution containing from about 15 to about 25 percent (v/v) piperidine in an organic solvent.
- 79. (Withdrawn – Currently Amended) The method of claim 78, wherein the deprotection reagent is 20 percent (v/v) piperidine in N,N'-dimethylformamide (DMF).
- 80. (Previously Presented) The method of claim 28, wherein the deprotection reagent is a solution containing from about 0.2% to about 4% (v/v) DBU in NMP.
- 81. (Withdrawn) The method of claim 80, wherein the deprotection reagent is about 2% (v/v) DBU in NMP.

82. (Currently Amended) The method of claim 28, wherein the sterically-hindered solid support is selected from the group consisting of: Trityl chloride resin (Trityl-Cl), 2-Chlorotrityl chloride resin, DHPP, ~~MBHA~~, 4-methyltrityl chloride resin, 4-methoxytrityl chloride resin, Hydroxy-(2-chlorophenyl)methyl-PS, Rink Acid Resin and NovaSyn TGT alcohol resin.
83. (Currently Amended) The method of claim 28, wherein the sterically-hindered solid support is Trityl chloride (Trityl-Cl) resin.
84. (Previously Presented) The method of claim 28, wherein the final loading of the PNA dimer on the solid support is greater than or equal to 0.08 mmol per gram.
85. (Withdrawn) The method of claim 28, wherein the final loading of the PNA dimer on the solid support is in the range from about 0.1 mmol per gram to about 1 mmol per gram.
86. (Withdrawn) The method of claim 28, wherein the final loading of the PNA dimer on the solid support is in the range from about 0.12 mmol per gram to about 0.35 mmol per gram.
87. (Previously Presented) The method of claim 41, wherein the first and second PNA monomers are t-boc/Z protected PNA monomers comprising the same or a different nucleobase.
88. (Previously Presented) The method of claim 41, wherein the first and second PNA monomers are Mmt/Bhoc protected PNA monomers comprising the same or a different nucleobase.
89. (Previously Presented) The method of claim 41, wherein the first PNA monomer is an Mmt/Bhoc protected PNA monomer and the second PNA monomer is an Fmoc/Bhoc protected PNA monomer.
90. (Previously Presented) The method of claim 41, wherein the nucleobase of the first and second PNA monomer is independently selected from the group consisting of: adenine, cytosine, guanine, thymine, uracil, 5-propynyl-uracil, 2-thio-5-propynyl-uracil, 5-

methylcytosine, pseudoisocytosine, 2-thiouracil and 2-thiothymine, 2-aminopurine, N9-(2-amino-6-chloropurine), N9-(2,6-diaminopurine), hypoxanthine, N9-(7-deaza-guanine), N9-(7-deaza-8-aza-guanine) and N8-(7-deaza-8-aza-adenine).

91. (Previously Presented) The method of claim 41, wherein the first PNA monomer is an Mmt/Bhoc protected PNA monomer and the deprotection reagent is a solution containing from about 1 to about 5 percent (v/v) dichloroacetic acid in an organic solvent.
92. (Withdrawn) The method of claim 91, wherein the deprotection reagent is about 2 percent (v/v) dichloroacetic acid in dichloromethane (DCM).
93. (Currently Amended) The method of claim 41, wherein the ~~solid support is a~~ sterically-hindered solid support is selected from the group consisting of: Trityl chloride resin (Trityl-Cl), 2-Chlorotrityl chloride resin, DHPP, ~~MBHA~~, 4-methyltrityl chloride resin, 4-methoxytrityl chloride resin, Hydroxy-(2-chlorophenyl)methyl-PS, Rink Acid Resin and NovaSyn TGT alcohol resin.

Claim 94 (Canceled)

95. (Withdrawn) The method of claim 41, wherein the final loading of the PNA dimer on the solid support is in the range from about 0.1 mmol per gram to about 1.2 mmol per gram.
96. (Withdrawn) The method of claim 41, wherein the final loading of the PNA dimer on the solid support is in the range from about 0.12 mmol per gram to about 0.35 mmol per gram.
97. (Currently Amended) A method comprising:
 - a) coupling a first PNA monomer to a sterically-hindered acid forming cleavable linker of a sterically-hindered solid support wherein the PNA monomer comprises a base-labile N-terminal amine protecting group;
 - b) optionally washing the solid support to remove excess first PNA monomer;
 - c) treating the solid support for a period of no more than about 1 to about 2 minutes with a deprotection reagent, under basic conditions, that deprotects the base-labile

- ~~N-terminal amine protecting group that removes the base-labile N-terminal amine protecting group from substantially all of the support bound first PNA monomer;~~
- d) washing the solid support to remove the deprotection reagent; and
 - e) coupling a second PNA monomer to the N-terminal amine of the first PNA monomer after performing steps (c) and (d) to thereby form a support bound PNA dimer.
98. (Previously Presented) The method of claim 97, wherein the first and second PNA monomers are Fmoc(Bhoc) PNA monomers comprising the same or a different nucleobase.
99. (Previously Presented) The method of claim 98, wherein the nucleobase of the first and second PNA monomer is independently selected from the group consisting of: adenine, cytosine, guanine, thymine, uracil, 5-propynyl-uracil, 2-thio-5-propynyl-uracil, 5-methylcytosine, pseudoisocytosine, 2-thiouracil and 2-thiothymine, 2-aminopurine, N9-(2-amino-6-chloropurine), N9-(2,6-diaminopurine), hypoxanthine, N9-(7-deaza-guanine), N9-(7-deaza-8-aza-guanine) and N8-(7-deaza-8-aza-adenine)
100. (Previously Presented) The method of claim 97, wherein the base-labile N-terminal protecting group is Fmoc.
101. (Withdrawn – Currently Amended) The method of claim 97, wherein the deprotection reagent is a solution containing from about 15 to about 25 percent (v/v) piperidine in an organic solvent.
102. (Withdrawn – Currently Amended) The method of claim 101, wherein the deprotection reagent is 20 percent (v/v) piperidine in N,N'-dimethylformamide (DMF).
103. (Previously Presented) The method of claim 97, wherein the deprotection reagent is a solution containing from about 0.2% to about 4% (v/v) DBU in NMP.
104. (Withdrawn) The method of claim 103, wherein the deprotection reagent is about 2% (v/v) DBU in NMP.

105. (Currently Amended) The method of claim 97, wherein the sterically-hindered solid support is selected from the group consisting of: Trityl chloride resin (Trityl-Cl), 2-Chlorotrityl chloride resin, DHPP, ~~MBHA~~, 4-methyltrityl chloride resin, 4-methoxytrityl chloride resin, Hydroxy-(2-chlorophenyl)methyl-PS, Rink Acid Resin and NovaSyn TGT alcohol resin.
106. (Currently Amended) The method of claim 97, wherein the sterically-hindered solid support is Trityl chloride (Trityl-Cl) resin.
107. (Previously Presented) The method of claim 97, wherein the final loading of the PNA dimer on the solid support is greater than or equal to 0.08 mmol per gram.
108. (Withdrawn) The method of claim 97, wherein the final loading of the PNA dimer on the solid support is in the range from about 0.1 mmol per gram to about 1 mmol per gram.
109. (Withdrawn) The method of claim 97, wherein the final loading of the PNA dimer on the solid support is in the range from about 0.12 mmol per gram to about 0.35 mmol per gram.

Claim 110 (Canceled)